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ENGINEERING PROGRESS

THE COVER

"An interesting feature event during the inauguration of electric service on the Virginian, was a contest in super-power, as shown on cover page. An electrically operated train of 6500 tons triumphing over a steam train of 5500 tons. Starting at the foot of the grade at Elmore, twenty minutes after the steam train with one 2-10-10-2 Mallet engine pulling and two others pushing, the other train, with one of the new electric monsters on each end, passed the steam train half way up the 15-mile grade at approximately twice the speed. In the picture the electric road locomotive has already passed the steam engine and the pusher locomotive can be seen coming around the curve."

AIR MAIL

An insight into the system of inspection used in the air mail service is given by J. E. Whitbeck, Superintendent of the Air Mail Service, in the *S. A. E. Journal*. Engines are overhauled after every 100 hours of flying service, and after five or six overhauls are torn down and only about 30% of the whole value in parts is salvaged, to be used in building other engines. Mechanical difficulties cause forced landings once in every 400 flying hours. Thirty per cent of these troubles are with the cooling system, 29 per cent with the ignition, 11 per cent with the carburation, and 8 per cent with lubrication.

STEEL INSPECTED BY X-RAY

Military experts, speaking at the national defense forum of the American Society of Mechanical Engineers, predicted the development of the X-ray to the point where it will render the explosion of big guns, due to inferior metals, impossible. Such explosions have cost the lives of many persons in the last few years. To prevent the use of unsound metal in the construction of guns, 260,000-volt X-ray equipment has been installed at the Watertown Arsenal, Watertown, Mass. The machine has already proved of value in the locating of flaws without cutting the castings to determine whether they are sound.

AMERICAN DYES

The report of the American dye industry covering its achievements during the past ten years indicates the great progress recently made in this field.

American dye manufacturers are now supplying fully 96 per cent of our domestic demand, and are now exporting 18,000,000 pounds of dyes a year. The quality of these dyes equals that of any other country.

RADIO TIME SIGNALS

Lieutenant George D. Cowie, of the U. S. Geodetic Survey, used successfully a radio recording device in accurate longitude determinations in southeastern Alaska. This apparatus is of a portable type and was recently perfected by Dr. E. A. Eckhardt, of the Bureau of Standards. Time signals of the Naval Observatory, sent from the radio station at Annapolis, are recorded on the same chronograph with the same pen as those that record the local time observations. With this device, any desired location can be used for the longitude station, which, previously, had to be near the ends of a cable or along telegraph wires. The radio results are fully as accurate as those obtained by the telegraphic method.

MILLIKAN RAY

Dr. Robert A. Millikan, director of the Norman Bridge Physical Laboratory (Pasadena, California), appearing before the American Association for the Advancement of Science, reported his five years' research upon a new ray, shorter, quicker, and more penetrating than the X-ray. It will pierce two feet of lead. It reaches the earth continuously from surrounding space. Dr. Millikan was unable to say what its source is, what its effects are, or how it can be directed.

RADIO IN HOTELS

The popular demand for radio in the United States has prompted the installation of receiving sets in some of the metropolitan hotels. Individual sets in each room are too expensive to run profitably, but a solution has been reached in the Robert Morris Hotel in Philadelphia. A simple receiver costing about \$25 is installed in each room. This set is connected with the main receiver in the lobby. The same program which is broadcasted in the lobby is sent to the rooms. The main telephone switchboard is also the control board for the receiver. The operator selects the best program which is being broadcasted at any particular time and plugs it into the rooms desiring service. The installation of radio in the rooms is a feature which has attracted many guests to the hotel, especially since this service is given without extra charge.

ALUMNI IN PRINT

Four technical articles by Ohio State Graduates have recently come to our attention.

The current issue of *Make Up* contained an article on "Friction Losses in Circular Pipe," by Don C. Stenbrenner, who graduated in Metallurgical Engineering. In the same issue Bernard F. Flood is the author of two articles, one on "Coal By-Products Plant," and the other bears the title "Chemical Hazards."

Professor Clyde T. Morris, who tells the story of the A. I. U. Building in this issue of the OHIO STATE ENGINEER, has written an article on the same subject which will have appeared by now in *The Engineering News-Record*.

ENGINEERS TO DESIGN A \$5,000,000 DAM

A board of consulting engineers to supervise plans and specifications for the construction of the Coolidge Dam on the San Carlos Indian Reservation in Arizona, was named June 22d by the commission of Indian Affairs with the approval of the Secretary of the Interior.

The dam, which will be built across the Gila River near San Carlos, will cost approximately \$5,000,000 and will store water for the irrigation of from 75,000 to 100,000 acres of Indian lands, public and private lands in the lower Gila River valley. It will furnish a permanent supply of water to the Pima Indians living on the San Carlos Reservation.—*Engineering News-Record*.

FUSED QUARTZ GLASS

A glass company in West Lynn has finally overcome the difficulties of the quantity production of fused quartz glass, and it is now producing astronomers' mirrors, both concave and convex, and even plate glass for windows on a commercial scale. Quartz owes its usefulness to its high melting point, 1715° C., and to its workability due to its low coefficient of expansion.